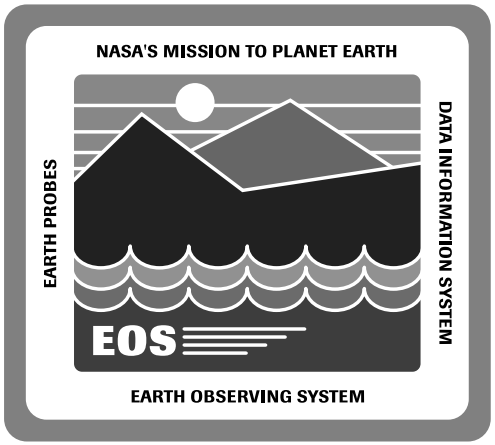


SDPS Evolvability

Mark Elkington

System Design Review - 29 June 1994

Evolvability Requirements

Evolvability Requirements Topics

Support additional data providers [5000, 5010, 5020]

Interoperability with current and proposed systems [5030, 5040, 5060]

DAAC unique services, configuration , data types [5200, 5210, 5220, 5230, 5240]

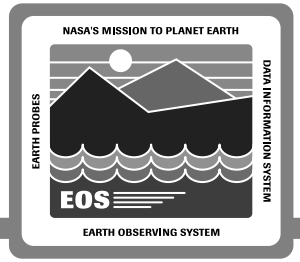
Science User Development Extensions, e.g. search, dynamic browsing [5300, 5310, 5320]

GCDIS participation and component reuse [5100, 5110]

Design Features

- **Autonomy (Distributed Authority)**
- **Heterogeneity**
- **Voluntary Cooperation**
- **Open Data/Service Model**
- **Multi-Protocol Support**
- **Cross-site Service Combination**
- **Location and Access Transparency**

Evolvability Test #1 - Significant Growth in Provider Sites



Vision

- 50+ SCFs (or Value-Added Providers) providing data and services
- ADCs/ODCs equivalent to ECS providers sites

Architectural Support

- DM Subsystem supports distributed search and access
- Interoperability features support location and access transparency
- Client Subsystem is extensible (framework approach)
- Data Server comprises reusable and separable components
- Data Server and DM extensible to handle new data types
- Planning Subsystem can work across sites
- compatible provider sites can be developed with small ECS component reuse (i.e. LIM) - complexity is scalable

Evolvability Test #1 . . .

Taking Advantage of Evolution

- community/domain oriented services and data
- increased possibility for collaboration and more dynamic research
- wider access (particularly through Value Added Providers/Intermediate Center), while protecting EOSDIS resources for core Global Change research support

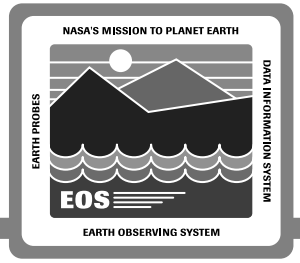
Additional ECS Capability Required*

* - over Release B

- more sophistication in Data Management components (i.e. DIM and DD)
- support for distribution of reusable components
- increased support for heterogeneous data products/services (e.g. translators etc.)
- more emphasis on 'standing order' output to value-added suppliers

SDS-4.11.2

Evolvability Test #2 - Quantum Increase in Computing Power



"not IF but WHEN"

Vision

- information web supporting sophisticated collaboration
- Gigaflop and 10's Gigabytes memory widely available on desktop
- Terabytes of disk are inexpensive (Petabytes affordable in ECS context)
- Gigabit communications widely available within research community and specifically linking many provider sites

Architectural Support

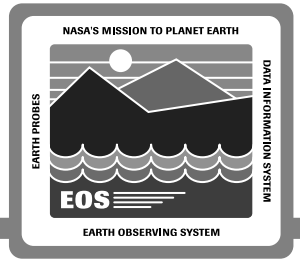
- distributed architecture able to take advantage of distributed computing power and high throughput links
- support for extensible analysis methods
- direct machine-to-machine access to Data Server
- subscriptions to user supplied feature/phenomenon detection algorithms ('alarms', 'events')

Evolvability Test #2 . . .

Taking Advantage of Evolution

- more sophisticated searching (the inter-site search vision)
- extensive reprocessing without need for peer approval of use of resources
- more analysis within ECS - including customized feature detection on arriving data
- more modelling with direct ingest of data
- instant access to continuously updated thematic products/models
- highly sophisticated visualization/collaboration - support for multi-media
- more dependencies between processing at different sites could be supported

Evolvability Test #2 . . .



Additional ECS Capability Required*

- refresh ECS hardware (processing, storage and network resources) more frequently
- fuller searching capability may involve more extensive schema - add more sophisticated schema management and appropriate Ops increase .... also may require more sophisticated DM components
- change in emphasis of Ops function from ingest/distribution/planning to data management and support
- support for dynamic user methods - i.e. processing methods delivered as part of a request for immediate execution
- extend Universal Reference to support multi-media
- new desktop tools
- additional methods - user community/provider site developed

* - over Release B